

(11)Publication number : 2000-305596

(43)Date of publication of application : 02.11.2000

(51)Int.Cl. G10L 17/00
G10L 15/00
G01C 21/00
G09B 29/00

(21)Application number : 11-116647

(71)Applicant : SONY CORP

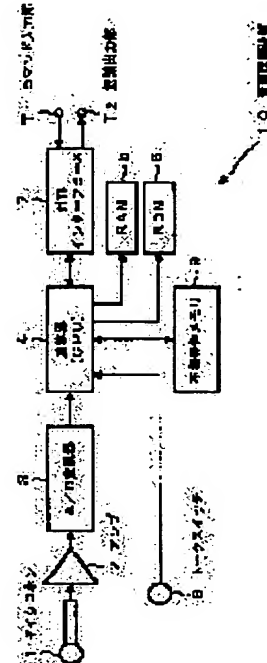
(22)Date of filing : 23.04.1999

(72)Inventor : YAMAMOTO EIJI

(54) SPEECH RECOGNITION DEVICE AND NAVIGATOR**(57)Abstract:**

PROBLEM TO BE SOLVED: To enable easy change of set information preliminarily registered for every user by the use of a speaker recognition function by recognizing the speech of specified speaker by a speaker recognition means, and switchingly outputting the set information of specified speaker from a storing means.

SOLUTION: This recognition device 10 includes a speech recognition means, a speaker recognition means to recognize the speech of a speaker from a speech input means, and a storing means in which individually set information of multiple speakers is preliminarily stored, and switchingly outputs the set information of specified speaker from the storing means after recognizing the speech of specified speaker by the speaker recognition means. In the device 10, an input signal from a microphone 1 is supplied to an amplifier 2 which amplifies it at a specified amplification ratio, and the amplified signal by the amplifier 2 is supplied to an A/D converter 3 and converted into a digital signal. The digital signal is supplied to a CPU 4 constructed of a microcomputer executing speech recognition processing and speaker recognition processing.

**LEGAL STATUS**

[Date of request for examination] 20.09.2000

[Date of sending the examiner's decision of rejection] 13.04.2004

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

THIS PAGE BLANK (USPTO)

THIS PAGE BLANK (USPTO)

CLAIMS

[Claim(s)]

[Claim 1] The voice recognition unit characterized by to accomplish so that a speech-recognition means recognize the voice from a voice-input means, a speaker-recognition means recognize the voice of the speaker from the above-mentioned voice-input means, and the storage means that stored beforehand each setting information of two or more users may be provided, specific user's speaker's voice may recognize with the above-mentioned speaker-recognition means and the change output of a specific user's setting information may carry out from the above-mentioned storage means.

[Claim 2] The navigation equipment characterized by to accomplish so that a speech-recognition means recognize the voice from a voice-input means, a speaker-recognition means recognize the voice of the speaker from the above-mentioned voice-input means, and the storage means that stored beforehand each setting information of two or more users provide, specific user's speaker's voice recognizes with the above-mentioned speaker-recognition means and the change output of a specific user's setting information may carry out from the above-mentioned storage means.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the voice recognition unit and navigation equipment which can be switched to the actuation and the operating condition which suited the user by speech recognition with respect to a voice recognition unit and navigation equipment.

[0002]

[Description of the Prior Art] It is classified into the text standalone version which can perform a speaker recognition from the former if the text dependence which determines beforehand the vocabulary which techniques [the technique of a voice recognition unit, a speaker recognition (discernment) (Speaker Recognition), or speaker verification (check) (Speaker Verification) is used widely, for example,] in a voice recognition unit, such as word speech recognition, a continuous speech

recognition, and word spotting, are known, and should speak by the approach of a speaker recognition, and the vocabulary of arbitration are uttered.

[0003] Moreover, in the information related equipment in which the microcomputer (it is described as Following CPU) was built, that whose setup of various actuation and operating conditions was enabled so that it could respond to various request conditions is proposed.

[0004] For example, in case a map is displayed, it has come to be able to perform selection of whether the display direction is displayed on a map, or to display the north of north, south, east and west above, and whether the function which can be operated is made into the beginner mode made into the minimum, and various setup of operation in the navigation equipment which contained CPU.

[0005]

[Problem(s) to be Solved by the Invention] Under the situation that two or more users put in frequently, and one above-mentioned navigation equipment is used, changing, whenever a user changes, in order to make a setting change, it was accompanied by troublesomeness. Although such setting modification could be changed by the remote controller (it is described as remote control below) etc., a setup was complicated and had required much time amount.

[0006] This invention tends to solve an above-stated technical problem, and tends to offer the voice recognition unit and navigation equipment which were accomplished so that the setting information beforehand registered for every user could be easily changed using a speaker-recognition function.

[0007]

[Means for Solving the Problem] The voice recognition unit and the navigation equipment of this invention possess a speech-recognition means recognize the voice from a voice input means, a speaker-recognition means recognize the voice of the speaker from a voice input means, and the storage means that stored beforehand each setting information of two or more users, and they constitute it so that specific user's speaker's voice may be recognized and the change output of a specific user's setting information may be carried out from the above-mentioned storage means with a speaker-recognition means.

[0008]

[Embodiment of the Invention] Hereafter, a voice recognition unit and navigation equipment are explained, using drawing 1 and drawing 2 as a gestalt of operation of this invention.

[0009] The block diagram showing the configuration of the voice recognition unit

which drawing 1 and drawing 2 show the example of 1 gestalt of this invention, and drawing 2 are flow charts which show actuation of the voice recognition unit in which the example of 1 gestalt of this invention is shown.

[0010] The amplifier 2 which amplifies the microphone input signal from the microphone 1 from which a voice recognition unit 10 changes voice into an electrical signal in drawing 1 with a predetermined amplification factor is supplied, the magnification signal amplified with amplifier 2 is supplied to an analog-digital converter (A/D converter), it changes into a digital signal and this digital signal is supplied to the operation part (it is described as Following CPU) 4 which consisted of microcomputers which perform speech recognition processing and speaker-recognition processing.

[0011] ROM6 by which the program and data of RAM5 used as memory for work pieces, speech recognition, and speaker-recognition processing were stored in CPU4, While the talk switch 8 which tells utterance initiation is connected to CPU4 through a bus, it is [the nonvolatile memory 9 for an information setup classified by speaker, and] the input section T1 of an action command. And the recognition output section T2 which outputs a recognition result It connects with an external interface 7. It connects with CPU4 through the external interface 7.

[0012] Actuation of the above-mentioned voice recognition unit 10 is explained below. first, the user of a voice recognition unit 10 -- command input area T1 from -- the 1st step S1 of drawing 2 or it performs speech recognition so that it may be shown -- a speaker recognition -- ***** -- that command is directed.

[0013] Since both the programs and recognition parameters of speech recognition and a speaker recognition are contained in ROM6, he is a command input area T1. And speech recognition or/and a speaker recognition can be chosen through an external interface 7 and CPU4.

[0014] There are techniques explained with the conventional technique, such as word speech recognition, a continuous speech recognition, and word spotting, in speech recognition like, and the difference among these methods can use this invention not related. Moreover, although a speaker recognition can be divided into speaker identification and speaker verification, whichever may be used in the semantics referred to as specifying a speaker.

[0015] Next, it is the 2nd step S2 at the same time it tells operating the talk switch 8 and inputting voice to CPU4 after this. Voice is inputted from a microphone 1 like.

[0016] After the inputted sound signal is amplified to level predetermined with amplifier 2, it is changed into a digital signal with A/D converter 3, and is supplied to

CPU4. As for the sound signal changed into the digital signal, speech recognition processing or/and speaker-recognition processing are performed by CPU4.

[0017] Namely, the 2nd step S2 CPU4 which suited the voice input standby condition is the 3rd step S3, when the sound signal from a microphone 1 is inputted. Command judging processing is started and it is the 1st step S1. It judges whether speech recognition is performed according to the directed command, or a speaker recognition is performed.

[0018] When speech recognition processing is chosen, it is the 4th step S4. CPU4 performs speech recognition processing and is the 5th step S5. A recognition processing result minds an external interface 7 so that it may be shown, and it is the recognition output section T2. It outputs.

[0019] The 3rd step S3 When a speaker-recognition command is chosen and it performs speaker-recognition processing, it is the 6th step S6. Speaker-recognition processing is performed spontaneously and a processing result is the 5th step S5. It is the recognition output section T2 about a recognition result output. It outputs. The 5th step S5 After termination is the 1st step S1. Processing of return and the above-mentioned explanation is repeated.

[0020] The 6th above-mentioned step S6 Although the probable speaker is chosen from the speaker list beforehand registered into nonvolatile memory 9 in speaker-recognition processing, these vocabularies may be registered into nonvolatile memory 9 when a speech recognition vocabulary is according to a speaker.

[0021] Furthermore, since a speaker recognition and speech recognition can be performed to coincidence in speaker-recognition processing if it is a text standalone version, it sets to the flow chart of drawing 2 , and it is the 1st step S1. An action-command input and the 3rd step S3 Command judging processing can be excluded.

[0022] In the voice recognition unit 10 of this invention, by giving the function to specify a speaker, the vocabulary of speech recognition is switched according to a speaker, or the training data for raising a recognition rate are given according to an individual, and it becomes possible to switch them automatically by the speaker recognition. That is, it changes that it is possible to use it in the automatically optimal condition for a user easily compared with being able to set it as the actuation for which it judged easily who a speaker was in giving a speaker-recognition function to a voice recognition unit, for example, the vocabulary was switched according to the speaker, and it was most suitable for the speaker, and an environment, and resetting up for every ** using other action commands.

[0023] Next, drawing 3 thru/or drawing 5 explain the navigation equipment which has an above-mentioned voice recognition unit. The flow chart of the block diagram showing the configuration of the navigation equipment which drawing 3 shows other examples of a gestalt of this invention, and the navigation equipment which drawing 4 shows other examples of a gestalt of this invention, and drawing 3 are the explanatory views of the operating-condition setting memory classified by user.

[0024] The navigation equipment which has the voice recognition unit of drawing 3 is constituted from a display unit 23 by the same voice recognition unit 10 and the navigation equipment 21 list with drawing 1 having explained.

[0025] Since it is the same configuration as drawing 1 , a voice recognition unit 10 gives the same sign to the same part, and omits duplication explanation.

[0026] Navigation equipment 21 has the main operation part (it is described as M-CPU below) 19 which consisted of the main computers etc., and supplies the electric wave from the antenna 25 for GSP to M-CPU19 through the current position detector 18.

[0027] In M-CPU19, it is the external interface 7 and the recognition output section T2 of a voice recognition unit 10. It minds and a speech recognition output is supplied.

[0028] Furthermore, RAM15 and ROM16 for work pieces, the nonvolatile memory 20 which stored the setting item of operation, the CD-ROM drive circuit 17 which drives a map disk, the speed sensor 14, and the remote control light sensing portion 13 grade are connected to CPU19 through the bus. Various actuation of navigation equipment is performed through remote control 24 and the voice interface processed with a voice recognition unit 10.

[0029] From M-CPU19, while outputting the map information from CD-ROM read in the CD-ROM drive circuit 17 to a display unit 23 as a video signal in the video-signal generation circuit 12, it has accomplished so that sound emission of the speech synthesis sound compounded in the electronic speech circuit 11 may be carried out through a loudspeaker 22.

[0030] Thus, actuation of the constituted navigation equipment is explained below. In addition, explanation of the part which is common in the voice recognition unit 10 shown in drawing 1 is omitted.

[0031] If the power source of navigation equipment 21 and a voice recognition unit 10 is switched on, CPU4 and M-CPU19 will perform predetermined initialization processing, and will be in operating state, respectively. Based on the electric wave from the satellite received with the antenna 25 for GPS, navigation equipment 21 calculates a self-vehicle location with the current position detector 18 and a speed

sensor 14, and asks for LAT LONG. The map data near LONG LONG for which it asked are read from a map disk with CD-ROM drive 17, a video signal is generated in the video-signal generation circuit 12, and it displays on a display unit 23. The activity of these single strings is done by the program built in ROM16 of M-CPU19.

[0032] In case RAM15 generates a video signal from map data, it is used as memory of the working-level month which performs conversion to bit map data from vector data, or memorizes current operating state.

[0033] As an actuation means of navigation equipment 21, it has two kinds of remote control 24, the remote control interface which consists of remote control light sensing portions 13, and the voice interface processed with a voice recognition unit 10. Although these two kinds of proper use uses together a remote control interface and a voice interface during a stop, it uses a voice interface during transit for insurance. The response from the navigation equipment at the time of using a voice interface uses the speech synthesis sound mainly generated in an electronic speech circuit 11.

[0034] Generally, the structure which sets up an operating condition according to liking of a user is built in navigation equipment. For example, in case a map is displayed, there is selection of the usable normal mode etc. about all [selection of whether a travelling direction is displayed above or to display the north of north, south, east and west above, and / the beginner mode which limited the function which can be operated to the minimum and all the functions]. It is better for these setup to be respectively possible and to be simply switched, when thinking of two or more users of navigation equipment. Also in the conventional navigation system, it was possible to have changed a setup with means other than speaker recognitions, such as remote control. By using the speaker-recognition function of a voice recognition unit 10 in this invention, a setup of operation according to user can be switched easily.

[0035] Drawing 4 is a flow chart which shows speaker-recognition processing of navigation equipment.

[0036] drawing 4 -- setting -- the 1st step ST 1 **** -- command input with the voice/remote control which chooses either a voice interface or a remote control interface is given by the user to the voice recognition unit 10 and the navigation equipment 21 in operating state.

[0037] M-CPU19 is the 2nd step ST 2. The command judging of the command of navigation or a user change command is performed.

[0038] The 2nd step ST 2 When operating navigation equipment 21, it is the 3rd step ST 3. It progresses and the usual navigation actuation is performed.

[0039] The 2nd step ST 2 When there is a user change command, it is the 4th step ST

4. A speaker recognition is performed, the result is followed and setting modification of the operating condition according to user is the 5th step ST 5. It is carried out.

[0040] The 3rd step ST 3 And the 5th step ST 5 After termination is the 1st step ST 1. It is returned and above-mentioned processing is repeated.

[0041] The 5th above-mentioned step ST 5 When making a setting change of the operating condition according to user, one example of the setting item of operation stored in nonvolatile memory is shown in drawing 5 .

[0042] In drawing 5 , three kinds of setting items, user ID, NABIMODO and a map screen, and guide voice, of operation are written in on memory.

[0043] User ID is used from the result of a speaker recognition as a key which selects a setting item of operation. It is the 3rd step ST 3 of the navigation of drawing 4 usual in a setting item of operation. It is used. Moreover, such a setup is memorized by nonvolatile memory 20 so that it may not be eliminated, also when navigation equipment is turned off.

[0044] Since the setups according to user can be easily switched using a speaker recognition according to the navigation equipment of this invention, it becomes possible to use the optimal actuation and the operating environment device which suited the user.

[0045]

[Effect of the Invention] According to the voice recognition unit and navigation equipment of this invention, by adding a speaker-recognition function to these equipments, a speaker is whom, or it can judge with voice, and equipment can be used now in the optimal condition easily and automatically compared with resetting up using other means by switching to the optimal configuration of operation automatically for the speaker (user). As a means which provides equipment with comparatively complicated operation with which a necessary target is to carry a voice recognition unit like especially navigation equipment, and the user interface is hierarchized with the operating procedure which changed with levels of skill of actuation, and is switched to it at the optimal configuration of operation, it is the optimal.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram of the voice recognition unit in which the example of 1 gestalt of this invention is shown.

[Drawing 2] It is the flow chart of the voice recognition unit in which the example of 1 gestalt of this invention is shown.

[Drawing 3] It is the block diagram of the navigation equipment in which other examples of a gestalt of this invention are shown.

[Drawing 4] It is the flow chart of the navigation equipment in which other examples of a gestalt of this invention are shown.

[Drawing 5] It is the explanatory view of the operating-condition setting memory classified by user used for the navigation equipment of this invention.

[Description of Notations]

4 [.. Main operation part (M-CPU), 21 / .. Navigation equipment, 22 / .. A loudspeaker, 23 / .. Display unit] 9 Operation part (CPU), 20 .. Nonvolatile memory, 10 .. A voice recognition unit, 19